

Mobile Adaptive Communication Support for Vocabulary Acquisition

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ABSTRACT: This work explores the use of an adaptive mobile tool for language learning. A school-based deployment study showed that the tool supported learning. A second study is being conducted in informal learning environments. Current work focuses on building models that increase our understanding of the relationship between application usage and learning.

KEYWORDS: Mobile assisted language learning, MALL, English language learning, modelling

1. INTRODUCTION

Learning a language is a difficult but rewarding experience. English is one example of a language where achieving mastery has economic benefits (Saiz & Zoido, 2005). This leaves many North Americans still in the process of learning English at an economic disadvantage (Gambino, Acosta, & Grieco, 2014). The use of mobile tools has been proposed to help alleviate this problem, but the use of mobile assisted language learning (MALL) has yet to be fully tested or adopted (Burston, 2014).

To better understand and support English language learner (ELL) needs, user-centred design was employed to develop an adaptive language learning and communication support tool. This MALL tool is called VocabNomad and it runs on android smartphones. It is intended to support learning by exposing ELLs to contextualized language usage. VocabNomad was developed and validated through a series of deployment and laboratory based studies (Demmans Epp, 2013). Following these formative evaluations, VocabNomad's effect on learning and the learning environment were assessed using a term-long deployment of the system in a Japanese high school. A second deployment study was then conducted where ELLs used the application during their everyday lives in a major Canadian city. These studies combined the use of detailed application logging with standardized and adaptive tests. This is allowing for the development of models that describe how specific mobile learning activities contribute to ELL vocabulary learning.

2. BACKGROUND

Spaced repetition has received considerable attention, with learning analytics leading to improved spacing algorithms (Godwin-Jones, 2010). However, many approaches to language learning have not received the same level of attention (Ballance, 2013; Burston, 2014) even though previous research suggests their importance (Graves, 2013; Wagner, Muse, & Tannenbaum, 2007). Among these

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approaches is situated learning or the use of language in context (Carey, 2004; Swain, 1995). The majority of previous evaluations of MALL tools that rely on the learner's context to support learning have been relatively short (Burston, 2014) with gains for specific vocabulary being observed. However, few studies have measured changes in global vocabulary knowledge (Burston, 2014) and even fewer have linked specific learner activities within MALL tools to gains in vocabulary knowledge (Ma, 2013). This means that we do not understand how learners benefit from different activities within MALL tools.

3. METHODOLOGY

To begin addressing the limited evaluation of MALL technologies and our lack of understanding of how MALL tool usage affects language learning, two evaluations of VocabNomad were planned. The first classroom-based study, now completed, used a non-equivalent control group design. Data collection has also been completed for the second study. This study takes place in informal learning environments and uses a single-subject with reversal design.

Both studies use a set of language assessments that measure global vocabulary knowledge (i.e., PPVT-4) and morphological knowledge (i.e., one's knowledge of how words are formed). The second study also tests participant vocabulary learning using an adaptive test based on participant exposure to learning materials within VocabNomad. In addition, VocabNomad performs detailed logging of student actions at the level of individual screen touches within the application: every character entered, scroll, and interface element touched is logged along with the timestamp of when the action took place. Unsupervised classification techniques (e.g., k-means clustering) are applied to these logs, and the resulting models will be used as an input to another model that describes the relationship between system usage patterns, the learner's morphological knowledge, and changes in his/her vocabulary knowledge. The combination of these data will help us to create models that enable our understanding of how system usage affects vocabulary learning rather than how the amount of system usage affects ELL vocabulary knowledge.

4. RESULTS

As expected, the first study showed gains in student global vocabulary knowledge when participants were using the application. It also showed that students' believed that their English-language abilities had improved. I am currently trying to build a model that relates student actions within the system to their learning gains using a discovery with models approach.

5. CONCLUSION

Data collection for the study of VocabNomad in informal learning environments was recently completed. The data from this study will be used to validate any of the models that can be identified using the data from the classroom-based study. This will allow us to see how well models of MALL usage

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generalize across learning contexts. It may also help us to better understand how to use these tools effectively by highlighting which learner actions within MALL systems are linked with positive learning outcomes.

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